

S-14637-F

FINAL

## FINAL REPORT

7N-89-CR

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The following is the final report on my IUE research program funded under P.O. S-14637-S entitled "Star Formation in the Taurus-Auriga Dark Clouds". For this program, we proposed to obtain IUE spectra of a number of very young stars in the Taurus-Auriga dark clouds. We were awarded 8 US1 shifts of IUE observing time during the sixteenth episode.

We obtained 10 low-dispersion spectra for 7 different young stars in the Taurus-Auriga dark clouds during our IUE shifts. The observations are listed in Table 1.

Table 1. IUE Observations of Young Stars

Name	Image	Expo (sec.)	Observing Date (UT)
V773 TAU	SWP 48578	18900	08 Sep 1993
CW TAU	LWP 26650	1140	28 Oct 1993
V410 TAU	SWP 48829	19500	02 Oct 1993
UX TAU A	SWP 48629	22200	13 Sep 1993
GK TAU	LWP 26647	1200	27 Oct 1993
GK TAU	LWP 26648	7200	27 Oct 1993
GK TAU	SWP 48590	19800	09 Sep 1993
DS TAURI	SWP 48904	25800	12 Oct 1993
LK CA 19	LWP 26649	5400	28 Oct 1993
LK CA 19	SWP 49129	24900	06 Nov 1993

The spectra were reduced using standard IUE RDAF software. Archival data on other young stars in the dark clouds were also examined. We found that the ultraviolet spectra of the classical T Tauri (CTT) stars and the weak-emission T Tauri (WTT) stars are quite different. Only the CTTs have ultraviolet excesses and strong far-ultraviolet lines, while the WTTs are much fainter. This result will aid in distinguishing the two types of young stars from each other and in characterizing the evolution of the stars.

(NASA-CR-197282) STAR FORMATION IN  
THE TAURUS-AURIGA DARK CLOUDS.

N95-70647

DISCRETE ABSORPTION COMPONENTS AND  
THE Be STAR PHENOMENON. AFFIRMATIVE  
DATA FOR COOL AND HOT BINARY

Unclass

SYSTEMS. CORRELATED UV/OPTICAL LINE  
PROFILE VARIATIONS IN MILD Be STARS 29/89

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Final Report (Computer Sciences  
Corp.) 4 p

## Final Report

### Discrete Absorption Components and the Be Star Phenomenon

To acquire the data for analysis of wind variability in Be stars, five US2 shifts on IUE were used, with the PI personally directing the observations. Thirty-three high dispersion spectra were acquired, primarily of Be stars which had been observed only once early in the mission. Discrete absorption components were observed in most of the target star spectra, indicating variability of the stellar wind in these objects. Preliminary data reduction was performed and master tapes created for European collaborators. This program was continued in later episodes of IUE observing. Thus the final analysis and publication will wait for data reduction of the full data set.

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## Final Report

### Affirmative Data for Cool and Hot Binary Systems

This grant assisted the acquisition and analysis of IUE observations for IUE 16th episode program HCPSP, "Affirmative Data for Cool and Hot Binary Systems". This program's goal was to obtain sufficiently good new exposures to permit definitive analysis for the temperatures, interstellar reddening, and luminosity ratios in several binary star systems. Partial results have been published, while the rest are in preparation for a journal article.

Publications benefitting from this grant :

Parsons, S.B., and Ake, T.B. 1994, "Luminosities of F Supergiant Stars from Main Sequence Companions", IAU Astronomy Posters Abstracts, IAU 22nd General Assembly (Den Haag), p. 232.

Final Report for NASA Contract P.O. S-14637-S (CSC Task 4120),  
IUE Episode 16, entitled "Correlated UV/Optical Line Profile  
Variations in Mild Be Stars"

By Myron Smith (PI), Sciences Programs, CSC

Monitoring observations of the four target Be stars in this program are conducted simultaneously with the IUE satellite and (at no cost to NASA) with the McMath-Pierce telescope on Kitt Peak in November, 1993.

The observations were reduced analyzed to search for correlations between variations in the optical He I "red" line at 6678 Angstroms and the resonance CIV lines and He II line at 1640 Angstroms in our IUE spectra. The optical spectra showed the formation on four occasions of "dimple" shaped features in the He I 6678 Angstrom lines. The corresponding IUE spectra showed that the C IV and He II lines showed weakenings attributable to emission. This finding strengthens the case found in an earlier IUE study on the Be star lambda Eri that the phenomenon responsible for dimples in the optical lines also causes signatures in certain strong ultraviolet lines. The fact the He II line shows a response suggests that the cause of dimples are transient sources which considerably hotter than the temperatures of the atmospheres of these stars.

This study shows that the formation of "dimple" features is widespread among Be stars and that optical-UV correlations are likely to be a common property among these stars. This work was presented to the Working group on Active B Stars of the International Astronomical Union at Den Haag, The Netherlands in August, 1994. We are accumulating these and related results for submission to a journal this year.

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